



STS-124 (26th Space Station Flight)

Discovery

Pad 39A:

123rd shuttle mission
35th flight of OV-103
69th landing at Kennedy Space Center

Crew:

Mark Kelly, commander (3rd shuttle flight)
Ken Ham, pilot (1st)
Karen Nyberg, mission specialist (1st)
Ron Garan, mission specialist (1st)
Mike Fossum, mission specialist (2nd)
Akihiko Hoshide, mission specialist (1st)
with the Japan Aerospace Exploration Agency
Greg Chamitoff, up to ISS
Garrett Reisman, down from ISS

Orbiter Preps:

Into OPF – 11/08/07
OPF Rollout – 04/26/08
VAB Rollout – 05/03/08

Launch:

May 31, 2008, at 5:02 p.m. EDT. A clean countdown produced a successful on-time launch. However, a walk-down of the pad after launch revealed severe launch damage on a 75' X 20' section of the east wall of the north flame trench. Investigation into the cause began immediately.

Landing:

June 14, 2008, at 11:15 a.m. EDT. On Runway 15 at Kennedy Space Center. Main gear touchdown was 11:15:19 a.m. Nose gear touchdown was 11:15:30 a.m. Wheelstop was



at 11:16:19 a.m. Mission elapsed time was 13 days, 18 hours, 13 minutes and 7 seconds, covering 5.7 million miles.

Mission Highlights:

Before docking with the International Space Station, Ken Ham and Karen Nyberg inspected the shuttle's thermal protection system using the end effector camera of the shuttle's robotic arm. The orbiter boom sensor system normally used was temporarily stored on the station by the STS-123 mission crew.

The shuttle docked with the station at 2:03 p.m. EDT June 2. Before docking, Commander Mark Kelly flew the shuttle through a slow backflip so that station crew members could take photos for ground experts to assess the health of Discovery's heat shield.

Using the station's robotic arm, Mission Specialists Akihiko Hoshide and Karen Nyberg removed the Japanese Pressurized Module from Discovery's payload bay and latched it to the Harmony module.

Cosmonaut Oleg Kononenko installed the

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spare gas liquid separator pump in the station's toilet to return it to useful service.

Astronauts Garrett Reisman and Greg Chamitoff replaced a bed in the carbon dioxide removal assembly that cleanses air on board the station.

EVA No. 1 — June 3: 6 hours, 48 minutes

After Mission Specialists Mike Fossum and Ron Garan disconnected cables and removed covers from Kibo's Pressurized Module while in Discovery's payload bay. Fossum and Garan also helped transfer the orbiter boom sensor system back to the shuttle, attaching it to the shuttle robotic arm. Then, the spacewalkers demonstrated a technique to clean debris from the station solar alpha rotary joint. Garan installed a new bearing on the joint. Fossum confirmed a spot noted previously is a divot.

EVA No. 2 — June 5: 7 hours, 11 minutes

Fossum and Garan continued outfitting the exterior of Kibo. They installed front and rear television cameras on the outside of the Kibo Japanese Pressurized Module, or JPM, removed thermal covers from the Kibo robotic arm system, and prepared a JPM upper docking port where the Kibo Logistics Module will be attached. They also prepared an external storage platform for the removal and replacement of a nitrogen tank assembly to be completed on the third spacewalk.

EVA No. 3 — June 8: 6 hours, 33 minutes

Fossum and Garan replaced a nitrogen tank on the station's starboard truss with a new one. Fossum then returned to the port SARJ and took samples of particulate matter from inside the joint, using a strip of tape, for engineers to analyze on Earth. He removed thermal insulation from the Kibo

robotic arm's wrist and elbow cameras and launch locks from one of the Kibo windows. He deployed debris shields on Kibo and tightened a bolt holding a TV camera in place.

Garan retrieved a video camera removed during the second spacewalk and reinstalled it.

Extra tasks included installing a thermal cover on Harmony's outside connectors, relocating a foot-restraint aid, and removing a launch lock on the starboard SARJ.

Expedition 17 Flight Engineer Greg Chamitoff and Nyberg later used the station's robotic arm to reposition the Japanese Logistics Module from the Harmony module to its permanent site on top of the Kibo laboratory. After the Kibo pressurized module's installation, all 10 crew members entered to sense the space.

Hoshide and Nyberg operated the robotic arm for its final deployment maneuver, then stowed the arm and checked out the brakes within its joints. They then opened the hatch between Kibo and its logistics module to use the module for storage.

The hatch between the station and Discovery was closed at 4:42 p.m. EDT June 10. The undocking was at 7:42 a.m. June 11. Pilot Ken Ham circled the station so the crew could take video and photos of the 330-ton complex.

Using the orbiter boom sensor system restored to Discovery's payload bay, the shuttle crew made a late inspection of the shuttle's heat shield. Imagery experts declared the heat shield safe for entry and landing.

The Mission Management Team revealed an object was seen floating away from the vehicle June 13 during the routine day-before-landing systems checkout to verify entry and landing system health. Engineers concluded the object was a heat-shield clip from the rudder/speed brake on the orbiter's tail that is used as a heat barrier during launch only and not a concern for entry.

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